Software Review Job Aid - Supplement #3

Example Letters, Agendas, and Report

January 16, 2004

INTRODUCTION

This supplement contains examples of items that might result from using the Software Review Job Aid. The contents are summarized below:

SECTION 1

SAMPLE NOTIFICATION LETTER AND MEETING AGENDAS

The notification letter and agendas included in this Appendix are to be used as examples. The length and emphasis of reviews may vary, depending on the project specifics. The sample notification letter is intended to be generic so that it may be used for any SOI. The specifics of the SOI activities are included in the sample agenda specific to that SOI.

If a review combines SOIs, the agendas and notification letter contents should also be combined. For example, if a reviewer combines SOI #1 and #2, the notification letter and agenda for SOI #1 and #2 would need to be combined into one letter and agenda.

Sample Notification Letter

U.S. Department
of Transportation
Federal Aviation
Administration

<directorate >
<ACO>
<address>

<date>

<addressee>
<address>

Subject: Software Review of the <**ABC system>** to be installed on the <**XYZ aircraft>**
Project: **<project #>**

Dear **<addressee>:**

The purpose of this letter is to notify you of the Federal Aviation Administration's (FAA) plans to conduct a software review of the <**ABC system**> to be installed on **the <XYZ aircraft**>. We have coordinated the date of <**date**> with your software program manager and appreciate your cooperation.

The purpose of this software review is to evaluate the <choose one or more - **planning/development/verification-test/final review>** phase of your software development program and to assess the compliance to the appropriate objectives of RTCA DO-178B, "Software Considerations in Airborne Systems and Equipment Certification". We anticipate that the review will last <**choose 1-5 days>**.

The review team will consist of the following personnel: **<XXX>.** Additionally, we request the support of one of your Designated Engineering Representatives (DERs) to be a part of the review team. Please inform us within the next 2 weeks which DER will be supporting this review, so that we can coordinate with that individual.

An agenda for the review is attached. Please assure that the appropriate personnel needed to support the activities outlined in the agenda will be available to answer questions and explain processes.

In order for the review team to adequately prepare, please send <**XXX one for each team member XXX>** copies of each of the following documents to the team leader no later than 2 weeks prior to the review: Plan for Software Aspects of Certification (PSAC), Software Development Plan (SDP), Software Configuration Management Plan (SCMP), Software Verification Plan (SVP), and Software Quality Assurance Plan (SQAP). Additionally, copies of all data listed on the agenda for review should be readily available for the on-site review.

Thanks for your cooperation. Should you have any questions, please contact <**xxx>** , the review team leader, at <###-###-####>.

<<Modify accordingly for conducting a desk review.>>

SAMPLE AGENDA FOR SOFTWARE REVIEW AT PLANNING STAGE

Purpose: The purpose of the software review is to review the <***ABC system***> to be installed on the <***XYZ aircraft***>.to assure that the planning activities comply with the appropriate objectives of DO-178B.

Date: The review is scheduled for <***date*** *(2 day average*)>

Data to be Reviewed: All planning documents (PSAC, SCMP, SQAP, SDP, SVP)
Standards
Safety Assessment
Other related documents

Review Team: ***<name>,*** ACO engineer
<name>, MIDO inspector
<optional: TS, CSTA, HQ, Directorate>
<XYZ or ABC> DER

DAY 1 Schedule:

8:00-8:30	Introductions and agenda overview	<Team Leader>
8:30-9:45	<ABC> and <XYZ> program status & overview	<Applicant>
9:45-10:00	Break	
10:00-11:00	Overview of safety assessment & system architecture	<Applicant>
11:00-11:30	Overview of review process and needed support	<Team Leader>
11:30-12:30	Lunch	
12:30-2:30	Review of PSAC	<Team>
2:30-2:45	Break	
2:45-4:00	Begin Review of SDP	<ENG team>
	Begin Review of SQAP	<QA/CM team>
4:00-4:30	FAA “end-of-day” meeting	<Team>

DAY 2 Schedule:

8:00-8:30	Explain daily activities	<Team Leader>
8:30-9:30	Continue review of SDP	< ENG team >
	Continue review of SQAP	< QA/CM team >
9:30-9:45	Break	
9:45-12:00	Review of SVP	< ENG team >
	Review of SCMP	< QA/CM team >
12:00-1:00	Lunch	
1:00-2:00	Review Development Standards	<Team>
2:00-3:00	Review Problem Reporting and Change Processes	<Team>
3:00-3:15	Break	
3:15-4:15	FAA “end-of-day” meeting and exit briefing prep	<Team>
4:15-5:00	Exit briefing & next steps	<Team Leader>

SAMPLE AGENDA FOR SOFTWARE REVIEW AT DEVELOPMENT STAGE

Purpose: The purpose of the software review is to review the <***ABC system***> to be installed on the <***XYZ aircraft***>.to assure that the software development activities comply with the appropriate objectives of DO-178B.

Date: The review is scheduled for <***date (3 day average***)>

Data to be Reviewed:
All planning documents (PSAC, SCMP, SQAP, SDP, SVP)
Standards
Safety Assessment
Software Requirements Data
Design Description
Source Code
Software Verification Results
Problem Reports
Software Configuration Management Records
Software Quality Assurance Records
Trace Matrix/Tool

Review Team:
<name>, ACO engineer(s)
<name>, MIDO inspector(s)
<optional: TS, directorate, HQ, CSTA>
<XYZ or ABC> DER

DAY 1 Schedule:

8:00-8:30	Introductions and agenda overview	<Team Leader>
8:30-9:30	<ABC> and <XYZ> program status & overview	<Applicant>
9:30-9:45	Break	
9:45-10:45	Review of plans and any changes since last review	<Team>
10:45-11:30	Review of changes process and any open items from previous review	<Team>
11:30-12:30	Lunch	
12:30-3:30	Perform top-down trace(s)	<ENG team>
	Review SQA processes/records	< QA/CM team >
3:30-4:30	FAA “end-of-day” meeting	<Team>

DAY 2 Schedule:

8:00-8:30	Explain daily activities	<Team Leader>
8:30-10:30	Continue top-down trace(s)	<ENG team>
	Continue review of SQA processes/records	< QA/CM team >
10:30-11:30	Perform bottom-up trace(s)	< ENG team >
	Review SCM processes/records	< QA/CM team >
11:30-12:30	Lunch	
12:30-3:30	Continue bottom-up trace(s)	< ENG team >
	Continue review of SCM processes/records	< QA/CM team >
3:30-4:30	FAA "end-of-day" meeting	<Team>

DAY 3 Schedule:

8:00-8:30	Explain daily activities	<Team Leader>
8:30-11:30	Review problem reports and change process	<Team>
11:30-12:30	Lunch	
12:30-2:30	Review of test cases and procedures (preliminary)	< ENG team >
	Review of archival, retrieval, release procedures	< QA/CM team >
2:30-3:30	FAA "end-of-day" meeting and exit briefing prep	<Team>
3:30-4:30	Exit briefing and next steps	<Team Leader>

SAMPLE AGENDA FOR SOFTWARE REVIEW AT VERIFICATION/TEST STAGE

Purpose: The purpose of the software review is to review the <***ABC system***> to be installed on the <***XYZ aircraft***>.to assure that the verification/test activities comply with the appropriate objectives of DO-178B.

Date: The review is scheduled for <***date (2 day average***)>

Data to be Reviewed:
All planning documents (PSAC, SCMP, SQAP, SDP, SVP)
Software Requirements Data
Design Description
Source Code
Software Verification Cases and Procedures
Software Verification Results
Problem Reports
Software Configuration Management Records
Software Quality Assurance Records
Trace Matrix/Tool

Review Team:
<name>, ACO engineer(s)
<name>, MIDO inspector(s)
<optional: TS, directorate, HQ, CSTA>
<XYZ or ABC> DER

DAY 1 Schedule:

8:00-8:30	Introductions and agenda overview	<Team Leader>
8:30-9:30	<ABC> and <XYZ> program status & overview	<Applicant>
9:30-9:45	Break	
9:45-10:45	Review of plans and any changes	<Team>
10:45-11:30	Review of any open items from previous review	<Team>
11:30-12:30	Lunch	
12:30-3:30	Review of verification cases and procedures	< ENG team >
	Review of configuration management data	< QA/CM team >
3:30-4:30	FAA “end-of-day” meeting	<Team>

DAY 2 Schedule:

8:00-8:30	Explain daily activities	<Team Leader>
8:30-10:30	Review of Verification Results	< ENG team >
	Review of SQA data	<QA/CM team >
10:30-11:30	Witnessing of selected tests	< ENG team >
	Perform build and load	< QA/CM team >
11:30-12:30	Lunch	
12:30-1:30	Continue witnessing selected tests	< ENG team >
	Review archival, retrieval, release procedures	< QA/CM team >
1:30-2:30	Review problem reports	<Team>
2:30-3:30	FAA "end-of-day" meeting and exit briefing prep	<Team>
3:30-4:30	Exit briefing and next steps	<Team Leader>

SAMPLE AGENDA FOR SOFTWARE REVIEW AT FINAL COMPLIANCE STAGE

Purpose: The purpose of this final software review is to conduct a final review of the <***ABC system***> to be installed on the <***XYZ aircraft***>.to assure that the overall software project complies with the appropriate objectives of DO-178B.

Date: The review is scheduled for <***date (1 day***)>

Data to be Reviewed:
All planning documents (PSAC, SCMP, SQAP, SDP, SVP)
Software Life Cycle Environment Configuration Index
Software Configuration Index
Problem Reports
Software Accomplishment Summary
Any data with open issues from previous review

Review Team:
<name>, ACO engineer(s)
<name>, MIDO inspector(s)
<optional: TS, directorate, HQ, CSTA>
<XYZ or ABC> DER

<u>Schedule</u>:

8:00-8:30	Introductions and agenda overview	<Team Leader>
8:30-9:30	<ABC> and <XYZ> program status & overview	<Applicant>
9:30-9:45	Break	
9:45-11:300	Review of any open items from previous reviews	<Team>
11:30-12:30	Lunch	
12:30-2:00	Review Software Accomplishment Summary	<ENG team>
	Review of Configuration Indexes	< QA/CM team >
2:00-3:00	Review problem reports and any other open items	<Team>
3:00-3:45	FAA “end-of-day” meeting and exit briefing prep	<Team>
3:45-4:30	Exit briefing and next steps, if appropriate	<Team Leader>

SECTION 2

EXAMPLE SOFTWARE REVIEW TRANSMITTAL LETTER AND REPORT

The sample transmittal letter in this appendix is generic for any SOI. The specifics of the letter may be filled in during or after the software review.

The software review report should accompany the transmittal letter and should be submitted to the applicant as soon as possible after the software review (1 week is the recommended turnaround time). The sample report in this Appendix was taken from an actual review, which combined SOI #2 and SOI #3. The Summary of Compliances/Findings/Observation tables are included as part of the report.

Sample Report Transmittal Letter

U.S. Department
of Transportation
Federal Aviation
Administration

<Directorate>
<name of ACO>
<address of ACO>

<date>

<Addressee>
<Address>

Subject: Software review report of the **<ABC system>** to be installed on the **<XYZ aircraft>**
Project: **<project #>**

Dear **<addressee>**:

The purpose of this letter is to summarize the results of the FAA software review of the **<ABC system>** be installed on the **<XYZ aircraft>**. This <**final compliance review>** was conducted **<date of review>**, with the goal assessing the compliance to the objectives of RTCA DO-178B, **<Level A>**. A report summarizing the details of the review and outlining the compliance to the objectives of DO-178B is attached.

Throughout the review several items were discovered that need to be addressed prior to certification of the **<XYZ aircraft>**. A summary of these certification items is included below and the details are outlined in the attached report:

- The traceability matrix must be cleaned up depicting the forward and backward traceability.
- The Engineering Change Proposals (ECPs) not implemented prior to certification must be analyzed by **<software developer>** engineers and Designated Engineering Representative (DER), by **<applicant>** engineers and DERs (both software and systems), and by the FAA Systems Engineers and Flight Test pilots. Any limitations imposed by the ECPs must be included as part of the Software Accomplishment Summary (see DO-178B, 11.20j) and must be addressed in the Aircraft Flight Manual.
- Need to follow the Software Verification Plan presented at this review.
  - Requirements-based testing program must be assessed and any short-comings addressed (see the Requirements-Based Testing Review section in the attached report for details).
  - Requirements-based testing must be against the Systems Requirement Document, rather than the Specification Control Document (SCD).
- The Problem Report (PR), ECP, and Information Transmittal Letter (ITL) configuration management process must be reviewed and improved (see the Problem Reporting Review section of the attached report).
- SCD deviations must be reconciled. We suggest updating the SCD to match the actual system on the aircraft (e.g., implement ITLs, PR changes, ECP changes into the SCD).
- Clean up the Software Accomplishment Summary prior to submitting to the FAA (see comments on objective 10-3 of the attached report).

- The problems found in this software review must be reconciled and it must be assured that the same types of problems do not exist in the rest of the data.
- Conduct an internal software review, similar to the one performed by the FAA, using both **<applicant>** and **<supplier>** DERs. Provide the review results to the FAA to reconcile the non-compliances found during this review.

The support provided by your company during this software review was excellent. Thanks to everyone who helped make the software review possible. Should you have any questions or comments, please contact **<team leader>** at **<telephone #>**.

<ABC System to be installed on XYZ aircraft>

Software Compliances/Findings/Observations Report for Development and Verification/Test Stages of Involvement (SOI #2 and SOI #3)

REVIEW TEAM:

<list all FAA and DERs>

DOCUMENTS REVIEWED:

ABC-005, Rev A, Software Verification Plan (SVP)
ABC-002, Rev B, Software Quality Assurance Plan (SQAP)
ABC-003, Rev C, Plan for Software Aspects of Certification (PSAC)
ABC-004, Rev A, Software Development Plan (SDP)
ABC-012, Software Configuration Management Plan (SCMP)
ABC500, Rev B, Specification Control Drawing (SCD)
ABC40-01, dated 6/11/97, Software Requirements Data (SRD)
ABC817-XX, Software Design Description (SDD)

TOP-DOWN TRACE FINDINGS/OBSERVATIONS (per Job Aid SOI #2):

Traced SCD Requirement 3.1.1.1.3.2.3, Runaway/Miscompare Monitor

- SRD, 4.4.3 (Sections 6 & 7):
- Section 6:
    - Traceability to 4.4.2.2 runaway detect function is called during shut-off-valve (SOV) and should not have been traced to RunJam (4.4.3.6, 4.4.3.7a, 4.4.3.7b).
    - 6a should also trace to 4.4.2.3 to actually declare local runaway condition.
    - 6a & 6b should also trace to 5.4.2.4 which is the Task Function for declaring runaway.
    - 6a & 6b on monitor side, the persistence counter is really 50 mS because it takes 5 frames instead of 4 to be declared runaway. Command channel is 40 mS. This does not meet SRD requirement of 30 mS persistence. (SDD, 5.4.2.4, 5.4.2.3, 5.3.12).
    - SRD 4.4.3 does not agree with SCD, since the SCD has not been recently updated. XYZ Systems engineers claim that SCD 3.1.1.1.3.2.3 will be changing.
- Section 6 & 7:
    - Section 6 & 7 do not reference Table 22, which defines the persistence values and fail condition.
- SCD, Figure 9:
- Runjam should result in a failure, not a fault.

Traced Jam Monitor, SCD Requirement 3.1.1.1.2.2.6

- SCD has not been updated to reflect the approved deviations. Therefore, inconsistency between SCD and SRD exist. The SCD did not contain the 8 degrees for the panel rate < 2 deg/sec, and Table V did not have 8 degree and 2 deg/sec. A letter dated XX/XX/XX specified the 2 deg/sec and 8 degree window; however, it was not implemented in the SCD.
- The 8 degree scaling comment in the software code documentation could be improved.
- The Trace Matrix needs to included SDD paragraphs 4.4.2.4 and 4.4.3(7di).

Cross Channel Monitors (CCM)

- The cross channel monitors requirements are not in SCD.
- Trace from SRD (4.4.2(3)) to code should only be performed in the monitor channel. For some reason, it is also traced to the command channel.
- 3.3.1 (3) of SRD, under 4.4.2 (4) of SRD: 5.2.7.3 should be removed from the SRD to SDD trace matrix.
- SRD to Software Qualification Test (SQT) trace matrix identified SQT paragraph 5.2.3; however, the SQT did not have data to substantiate 4.4.3 of SRD.

BOTTOM-UP TRACE FINDINGS/OBSERVATIONS (per Job Aid SOI #2):

- Trace performed was:
  Code: CCDL.C (CCDL_monitor_processing function) **to**
  SDD: 5.2.7.4 **to**
  SRD: 4.4.2 (7a) **to**
  SC-140, which traces to SCD 3.1.1.1.3.3.3
  SRD: SDD to SRD trace should have included Table 22, item 15 ***to***
  SC-045, which traces to SCD 3.1.1.1.2.2.2.1
  SRD: SDD to SRD trace should have included Table 22, all ***to***
  SC-084, SC-102, SC-105
  SC-084, traces to SCD 3.1.1.1.3.1
  SC-102, traces to SCD 3.1.1.1.3.2
  SC-105, traces to SCD 3.1.1.1.3.2.1

  Problems with the Trace:
  - Since Table 22 was not found in the SDD to SRD trace, there was no apparent backwards traceability to SCD requirements 3.1.1.1.2.2.2.1, 3.1.1.1.3.1, and 3.1.1.1.3.2.
  - SC-147 was not found in the backward trace. In forward trace, SC-147 traces to SRD 4.4.2 “all” (SCD to SRD trace); yet, there is no SRD 4.4.2 “all” entry in SRD to SDD matrix. Nor was there a single entry for each item under SRD 4.4.2.
  - SRD to SDD matrix has Table 22 “all” entry which traces to SDD 4.4.1.6, not 5.2.7.4, which is also related. The trace also gives CSCI as Command, but doesn’t address Monitor. The entry in the matrix is incomplete.
  - Summary: The incomplete Table traces and the “all” entries caused holes in the bottom-up traceability.

PROBLEM REPORTING PROCESS REVIEW (per Job Aid SOI #3):

Distribution: Problem reports should be distributed to Software Configuration Control Board (SCCB) members.

Blank Problem Reports:

a) Block 3 (Life Cycle Activity) should include SQT, SRD, SCD.
   - Example: PR #80: Block 3 is recorded as SQT. However, the PR process did not have a SQT.
b) Block 4: Since not only <supplier> people are generating Problem Reports, you may want to delete the originator statement "Must be **<supplier>** Person"

Problem Report Review and Logging:

a) Need to have a logging method for assigning new PR number at a centralized log book. This precludes duplicate PR numbers.
b) Distribution of PRs or updated PRs to SCCB members and others prior to the meeting should occur.

Problem Reporting Disposition:

a) First bullet: include "SCCB members" in lieu of "me".
b) Need to add another bullet to include distribution of PR disposition to SCCB members.
c) Need to expand "Disposition" to include test results, analysis, meeting minutes of SCCB, supporting data, etc. These should be attached to PRs.
d) Identify any Life Cycle data affected by PRs.

General Comments:

a) List names of SCCB members.
b) Identify that SCCB members have authorization to sign off PRs.

MODULE TESTING REVIEW (per Job Aid SOI #3):

- Modified Condition Decision Coverage (MCDC) test for CMD_RUNJAM.C was reviewed.
  - Notation on code listing did not annotate a third set of conditions for line 509, 510; however, the test case was run (TC8-21).
- PR-0067
  - Analysis is not complete, since it only looked at the global runaway flag and not the actual flag that was set.
  - The PR said "no system effect", yet the timing exceeded the budget for SOV. The PR was closed without determining whether the runaway could be inadvertently cleared in the code.
- PR-0064
  - PR-0064 was found during MCDC testing. The persistence can be >4, even though it should be cleared to zero. The next time the jam exists, it immediately disengages the SOV without a persistence count.
- In RUNJAM.C the persistence count was >4 for the Monitor side. In order to pass the test, the output threshold for persistence count was changed to 2 instead of 0 (i.e., the thresholds were changed after initial running and failure of the test).

REQUIREMENTS-BASED TESTING REVIEW (per Job Aid SOI #3):

- High level testing is to SCD rather than SRD. Derived requirements may not get tested with this approach.
  - DO-178B 6.4.3b state that requirements level testing should concentrate on the interrelationships between software requirements and software architecture. It does not say "systems" requirements.
- Robustness testing for high level requirements may need to be more thoroughly carried out. In looking at the SQT test case for SCD requirement 3.1.1.1.3.2.3, Runaway/Miscompare Monitor, robustness testing seemed nominal.
- The independence of the requirements-based testing of the Monitor function is questionable. The same person who wrote the code for the Monitor channel also wrote the requirements-based test cases. FAA requests DERs to assess this situation to determine what corrective action needs to be taken. Recommend obtaining FAA approval of the approach prior to implementation.

The attached Summary of Compliance Findings/Observations summarize the DO-178B objectives that remain open and require additional action prior to certification.

SAMPLE OF COMPLETED SUMMARY OF COMPLIANCES/FINDINGS/OBSERVATIONS FORM

Anx Ref #	Objective Summary	Summary of Compliances/Findings/Observations LEVEL A
1-1	Software development and integral processes activities are defined. 4.1 a, 4.3	Complies: Reviewed PSAC, SDP, SVP, SQAP, and SCMP against all DO-178B objectives (i.e., mapped the plans against the objectives to ensure that all objectives will be addressed).
1-2	Transition criteria, inter-relationships and sequencing among processes are defined. 4.1b, 4.3	Complies: Reviewed PSAC, SDP, SVP, SQAP, and SCMP against all DO-178B objectives (i.e., mapped the plans against the objectives to ensure that all objectives will be addressed).
1-3	Software life cycle environment is defined. 4.1c	Complies: Reviewed PSAC, SDP, SVP, SQAP, and SCMP against all DO-178B objectives (i.e., mapped the plans against the objectives to ensure that all objectives will be addressed).
1-4	Additional considerations are addressed. 4.1d	Complies: Reviewed PSAC, SDP, SVP, SQAP, and SCMP against all DO-178B objectives (i.e., mapped the plans against the objectives to ensure that all objectives will be addressed).
1-5	Software development standards are defined. 4.1e	Complies: Reviewed PSAC, SDP, SVP, SQAP, and SCMP against all DO-178B objectives (i.e., mapped the plans against the objectives to ensure that all objectives will be addressed).
1-6	Software plans comply with this document. 4.1f, 4.6	Observation: SQA Plan could use some work (see comment on objective #9-1).
1-7	Software plans are coordinated. 4.1g, 4.6	Complies: Reviewed PSAC, SDP, SVP, SQAP, and SCMP against all DO-178B objectives (i.e., mapped the plans against the objectives to ensure that all objectives will be addressed).
2-1	High-level requirements are developed. 5.1.1a	Complies. Documented in ABC40-01, dated 6/11/97, Software Requirements Data (SRD).
2-2	Derived high-level requirements are defined. 5.1.1b	Observation: Difficult to trace derived requirements.
2-3	Software architecture is developed. 5.2.1a	Complies. Call tree is documented in ABC817-XX, Software Design Description (SDD).
2-4	Low-level requirements are developed. 5.2.1a	Complies. Documented in ABC817-XX, Software Design Description (SDD).
2-5	Derived low-level requirements are defined. 5.2.1b	Complies. Documented in ABC817-XX, Software Design Description (SDD).
2-6	Source Code is developed. 5.3.1a	Complies. Reviewed source code written in C.
2-7	Executable Object Code is produced and integrated in the target computer. 5.4.1a	Complies. EOC has been compiled (in a preliminary format) and is being tested on the target computer.
3-1	Software high-level requirements comply with system requirements. 6.3.1a	Finding: There are many discrepancies between the SCD and SRD, due to the outdatedness of the SCD. SCD needs to be updated to reflect the actual system being designed.
3-2	High-level requirements are accurate and consistent. 6.3.1b	SCD is out of date. Need to update SCD to implement ITLs, etc.

Anx Ref #	Objective Summary	Summary of Compliances/Findings/Observations LEVEL A
3-3	High-level requirements are compatible with target computer. 6.3.1c	Complies. Looked at review records regarding compatibility of requirements.
3-4	High-level requirements are verifiable. 6.3.1d	Finding: They are verifiable but have not been adequately tested.
3-5	High-level requirements conform to standards. 6.3.1e	Complies. Reviewed threads against the requirements standards.
3-6	High-level requirements are traceable to system requirements. 6.3.1f	Finding: Traceability exists. The traceability matrix still needs some work. There was not always traceability between SCD and SRD, because the SCD needs updated.
3-7	Algorithms are accurate. 6.3.1g	Complies. Reviewed verification records documenting independent review of algorithms.
4-1	Low-level requirements comply with high-level requirements. 6.3.2a	Complies. Performed several traces (see above).
4-2	Low-level requirements are accurate and consistent. 6.3.2b	Complies. Performed several traces (see above).
4-3	Low-level requirements are compatible with target computer. 6.3.2c	Complies. Looked at review records regarding compatibility of requirements.
4-4	Low-level requirements are verifiable. 6.3.2d	Complies. Performed several traces (see above) and considered the verifiability of the requirements.
4-5	Low-level requirements conform to standards. 6.3.2e	Not assessed. Request DERs to verify in a software review.
4-6	Low-level requirements are traceable to high-level requirements. 6.3.2f	Finding: Traceability matrix needs some cleaning up. See the section on Top-Down and Bottom-Up Trace Findings for specific details. Overall, this objective is close to compliance.
4-7	Algorithms are accurate. 6.3.2g	Finding: An error was found in the persistence counting for the runjam.c on the monitor side. See the Top-Down Trace Findings and the Module Testing Review sections of the report.
4-8	Software architecture is compatible with high-level requirements. 6.3.3a	Calling trees were included in the SRD; however, we did not have time to adequately assess them. Request DERs to assess calling trees in a SW review.
4-9	Software architecture is consistent. 6.3.3b	Same as 4-8.
4-10	Software architecture is compatible with target computer. 6.2.3c	Same as 4-8.
4-11	Software architecture is verifiable. 6.3.3d	Same as 4-8.
4-12	Software architecture conforms to standards. 6.3.3e	Same as 4-8.
4-13	Software partitioning integrity is confirmed. 6.3.3f	Same as 4-8.
5-1	Source Code complies with low-level requirements. 6.3.4a	Same as 4-8.

Anx Ref #	Objective Summary	Summary of Compliances/Findings/Observations LEVEL A
5-2	Source Code complies with software architecture. 6.3.4b	Same as 4-8.
5-3	Source Code is verifiable. 6.3.4c	Same as 4-8.
5-4	Source Code conforms to standards. 6.3.4d	Same as 4-8.
5-5	Source Code is traceable to low-level requirements. 6.3.4e	Same as 4-8.
5-6	Source Code is accurate and consistent. 6.3.4f	Finding: One error found in the runjam SRD and code (see Top-Down Trace Findings). Other portions of the code seemed accurate.
5-7	Output of software integration process is complete and correct. 6.3.5	Not assessed.
6-1	Executable Object Code complies with high-level requirements. 6.4.2.1, 6.4.3	Finding: Complies with SRD but not SCD.
6-2	Executable Object Code is robust with high-level requirements. 6.4.2.2, 6.4.3	Observation: Robustness testing seemed to be weak (see Requirements-Based Testing Review section of report).
6-3	Executable Object Code complies with low-level requirements. 6.4.2.1, 6.4.3	Complies. Reviewed test cases and results.
6-4	Executable Object Code is robust with low-level requirements. 6.4.2.2, 6.4.3	Same as 6-2.
6-5	Executable Object Code is compatible with target computer. 6.4.3a	Complies. Reviewed test cases and results.
7-1	Test procedures are correct. 6,3,6b	Observation: See comments in Requirements-Based Testing Review section of report.
7-2	Test results are correct and discrepancies explained. 6.3.6c	Finding: Test thresholds were changed without changing the SCD requirements. See comments in Module Testing Review section of report.
7-3	Test coverage of high-level requirements is achieved. 6.4.4.1	See Requirements-Based Testing Review section of the report.
7-4	Test coverage of low-level requirements is achieved. 6.4.4.2	Complies. Observation: Difficult to trace, because it is included as part of the module testing, rather than the requirements-based testing.
7-5	Test coverage of software structure (modified condition/decision) is achieved. 6.4.4.2	Complies. Great job on module testing.
7-6	Test coverage of software structure (decision coverage) is achieved. 6.4.4.2a, 6.4.4.2b	Same as 7-5.

Anx Ref #	Objective Summary	Summary of Compliances/Findings/Observations LEVEL A
7-7	Test coverage of software structure (statement coverage) is achieved. 6.4.4.2a, 6.4.4.2b	Same as 7-5.
7-8	Test coverage of software structure (data coupling and control coupling) is achieved. 6.4.4.2c	Did not assess. Request DER evaluation and report out.
8-1	Configuration items are identified. 7.2.1	Complies. Reviewed the items and the configuration library status report.
8-2	Baselines and traceability are established. 7.2.2	Complies. Evaluated the configuration management records.
8-3	Problem reporting, change control, change review, and configuration status accounting are established. 7.2.3, 7.2.4, 7.2.5, 7.2.6	Finding: In the area of problem reporting, no analysis is being carried out in order to trace the problem back to the origination (i.e. SCD, SRD, etc.). Life cycle data is not being updated. Finding: Tolerance to the Specification Control Drawing are being opened (via opening TSP requirements) without ECP approval. Finding: Reference PR-0081 and PR-0083 as examples of Systemic Problem (Delta testing from 17/16 to 18/17).
8-4	Archive, retrieval, and release are established. 7.2.7	Complies. Evaluated the configuration management records.
8-5	Software load control is established. 7.2.8	Complies. Evaluated load procedures and witnessed a load.
8-6	Software life cycle environment control is established. 7.2.9	Complies. Evaluated the configuration management records.
9-1	Assurance is obtained that software development and integral processes comply with approved software plans and standards. 8.1a	Finding: SQA Plan needs more "beef". It needs to more clearly define SQA's authority and the process inputs and expected outputs and measures to these.
9-2	Assurance is obtained that transition criteria for the software life cycle processes are satisfied. 8.1b	Complies. Evaluated the transition criteria during the thread analysis.
9-3	Software conformity review is conducted. 8.1c, 8.3	Still to come – not yet performed. To be evaluated in the future.
10-1	Communication and understanding between the applicant and the certification authority is established. 9.0	Complies. DER involved and provides regular status to the ACO.
10-2	The means of compliance is proposed and agreement with the Plan for Software Aspects of Certification is obtained. 9.1	Complies. PSAC was accepted by DER and the ACO.

Anx Ref #	Objective Summary	Summary of Compliances/Findings/Observations LEVEL A
10-3	Compliance substantiation is provided. 9.2	Configuration Index (CID) was not adequately reviewed during this review, because of time constraints. Request that DERs assess the accuracy of the CID during a SW review. Software Accomplishment Summary (SAS) still needs some work: - The listing of Problem Reports in the SAS must be accurate; they must be officially closed through the SCCB in order to be reported as being closed in the SAS. - The compliance statement section of the SAS should address each of the DO-178B Tables A-1 to A-10 objectives. List each objective and how it is met. - Request DER Review of the SAS to assure that the DO-178B, Section 11, elements are included and are accurate. - Good job of summarizing how you deviate from the plans.